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## THE METEOROLOGICAL CONGRESS.\*

MONDAY, August 21st, at ten a. m. the congresses of the Department of Science and Philosophy of the Congress Auxiliary of the Columbian Exposition were formally opened at the Memorial Art Institute of Chicago with an address of welcome by the President, Mr. C. C. Bonney, followed by responses from representatives of the various special congresses. At the close of this general session the different divisions met in rooms assigned to them, the Division of Meteorology, Climatology and Terrestrial Magnetism meeting in room XXXI, in which the regular sessions were held daily from 10 a. m. to 2 p. m. from August 21st to August 24th.

The chairman of the Congress not being able to be present in person the first day, Prof. F. H. Bigelow, representing Prof. Mark W. Harrington, opened the session at eleven a. m. of the 21st with a few words of welcome and a statement of the objects of the Congress.

The Congress had no legislative authority. The main purpose, as previously announced, was to collect together a series of memoirs "outlining the progress and summarizing the present state of our knowledge of the subjects treated," and to print them in full in the English language.

The meetings, while thus making the reading and discussion of papers a matter of secondary importance, were by no means lacking in interest or profit to those who were present. But few of the papers could be read in full, owing to their great number and the absence of many of the authors. In all about 130 papers were read by title, in abstract or in full, forming a most valuable collection of memoirs prepared by writers of authority in their respective lines of research.

Among so many papers of merit, a simple list of which would occupy several pages, individual mention cannot be fairly attempted.

While the papers were read in general session, they were assigned, in the program, to various sections, according to the subject, each section being placed in charge of a responsible chairman.

Section A. Prof. C. A. Schott, U. S. Coast Survey, and Mr. H. H. Clayton, U. S. Weather Bureau, Chairmen. The papers of this section are devoted to instruments, their history and relative merits, and to methods of observation, especially to methods of observing in the upper air.

Section B. Prof. Cleveland Abbe, U. S. Weather Bureau, Chairman. This section is the most extensive in its scope, dealing mostly with questions in dynamic meteorology; much attention is given to the study of thunderstorm phenomena in various countries.

Section C. Prof. F. E. Nipher, Washington University, Chairman, comprises a series of sketches of the climate of different portions of the globe.

Section D. Major H. H. C. Dunwoody, U. S. Army, Chairman, is devoted to the discussion of the relation of the various climatic elements to plant and animal life.

Section E. Lieut. W. H. Beehler, U. S. Hydrographic Office, Chairman, deals with questions relating to marine meteorology, particularly to ocean storms and their prediction, methods of observation at sea, and international co-operation. During the reading of a paper on the work of the Hydrographic Office of the Navy, Lieut. Beehler had on exhibition a fine bust of Lieut. Maury by the sculptor Valentine, of Richmond, Va.

Section F. Prof. Charles Carpmael, Director of the Canadian Meteorological Service, and Mr. A. Lawrence Rotch, Director of the Blue Hill Observatory, Chairmen, comprises papers relating to the improvement of weather

services and especially to the progress of weather forecasting.

Section G. Prof. F. H. Bigelow, U. S. Weather Bureau, Chairman, deals with problems of atmospheric electricity and terrestrial magnetism and their cosmical relations.

Section H. Prof. Thomas Russell, of the U. S. Lake Survey, Chairman, has to do with rivers and the prediction of floods.

Section I. Oliver L. Fassig, Librarian U. S. Weather Bureau, Chairman, is devoted to historical papers and to bibliography, with special reference to the history of meteorology in the United States.

Prof. Mark W. Harrington, Prof. F. H. Bigelow, Capt. P. Pinheiro, of Rio Janeiro, and Lieut. W. H. Beehler successively presided over the meetings. The printed program distributed at sessions of the Congress contains a list of all papers presented; copies of this may be obtained from the Secretary upon application.

At the close of the last session a resolution was offered calling for recommendations by the Congress relating to (a) international co-operation in observations of auroras, (b) simultaneous Greenwich noon observations daily at all stations on land and sea, in addition to observations at other times, (c) investigation of the earth's magnetic polar current and the exact determination of the solar rotation. As the Congress had no legislative authority, it was agreed to hold a special session for the consideration of these questions after adjournment, on the following day.

Preparations have been begun for the printing of the papers and an effort will be made to complete the work at an early date. Oliver L. Fassig, U. S. Weather Bureau, Washington, D. C., is the Secretary.

## SALT TIDE MARSHES OF SOUTH JERSEY.

BY JOHN GIFFORD, SWARTHMORE COLLEGE, PA.

The mainland of the peninsula of South Jersey is fringed by many miles of marsh meadow. At times this level plain is completely covered by water. It consists of a mass of soft blue-black, bad-smelling mud, covered with a thick sod of grasses, rushes and sedges, and intersected by many winding, reed-fringed creeks, shallow bays, salt ponds and thoroughfares.

These marshes are separated from the ocean by a long line of low, sandy sea-islands, between which there are inlets through which the tides flow swiftly.

This stretch of marshland is of very recent origin. During Indian times it was probably a shallow sea. This accounts, perhaps, for the enormous quantities of clams and oysters which then existed. The majority of the bays in the marshes are very shallow and may, also, in the course of time, become unfit for oysters.

The rivers of South Jersey holding fine sand in suspension flowed into an ocean where there was practically no current. This material was then, in consequence, deposited, and there was thus formed a long sub-marine bank. This tripped the waves into breakers, which lifted the sand into a long line of low sea-islands.

The combined estuaries of these rivers formed a long, shallow inland sea, in which, owing to the slackening and meeting of currents, enormous quantities of silt were deposited. Wild water-fowl and winds disseminated the seeds of grasses and sedges on the mud bars, which were soon formed. The decay of each year's vegetation and the scum of mud left by every tide caused a gradual thickening of the sod. Three hundred thousand acres of marsh region have thus been recently formed.

Being an estuary, the scouring force of the tides prevents the formation of extensive beaches on the bay-side of Jersey. The sand is held in suspension until the cur-

\*Held at Chicago, August 21st to August 24th, 1893.